D R A F T Meeting Minutes

Delaware Spatial Data I-Team

1:00 p.m.
September 9, 2003

Conference Room A
State Budget Office
Thomas Collins Building
Dover, DE

I-Team Members Present:
Connie Holland, Office of State Planning Coordination
Dick Sacher, UD/RDMS
John Talley, DGS
Sandy Schenck, DGS
Margie Duranko, Kent County
Tim Westbrook, New Castle County
Matthew Laick, Sussex County
NV Raman (For John Hughes), DNREC
Vince Rucinski (For Nathan Hayward), DelDOT
Mark Headd (For Tom Jarrett), Dept. of Technology and Information

Others Present:
John Callahan, UD/RDMS
Mark Nardi, USGS
Roger Barlow, USGS
Mike Mahaffie, Office of State Planning Coordination

Welcome and Introductions
Connie Holland started the meeting at approximately 1:11 p.m. with a welcome and introductions.

Approval of May 29, 2003 Minutes
A motion was made by John Talley, seconded by Dick Sacher, and unanimously approved by all members present to accept the minutes of the May 29, 2003 meeting.

Project Updates
Elevation Data Project
Mike Mahaffie gave an update on the effort to craft a statewide LIDAR project to collect new elevation data. A Request for Proposals (RFP) in the early part of the year yielded 10 proposals that were so varied in approach and cost that the Elevation Data Working Group has decided to rescind that RFP and craft a new

RFP with more carefully crafted specifications. David Carter, of DNREC, has the lead on this effort.

Mark Nardi explained that, meanwhile, the USGS and NASA will fly a LIDAR mission over the Prime Hook refuge to aid in phragmites mapping. As part of this project, Dave carter and staff will have a chance to meet with NASA to gain knowledge for use the in new RFP. Coverage areas will be discussed.

Roger Barlow added that USGS will collect LIDAR for Bombay Hook and the Dover area as part of the 133 Urban Areas program.

Roger and Bill added that they have started discussions, internally, about using the NASA contractor for wider work in Delaware. Several; factors will have to addressed, including whether the "raw" nature of the sort of data the NASA project collects would be acceptable for FEMA floodplain mapping and whether NASA can compete for a state RFP. Mike Mahaffie will check on the latter with State Purchasing. If that is not a problem, USGS and NASA will explore whether such data will be useful to FEMA.

Cadastral/Transportation Committee Update
Tim Westbrook reported that the group has met several times to develop a Cadastral Data Standard. Tim noted that lots of raw data has been gathered and that the next meeting will be October 1.

Sandy Schenck reported that the USGS has completed a pilot project to test the adjustment of centerline data to the new orthophotography in three areas of New Castle County and that the USGS project may be a way to get part of the work done to realign the centerline files. It remains to be seen whether this will be of real use to the County GIS staff. There are also uncertainties about the availability of funding within the USGS for the project. Sandy will continue discussions with USGS on this matter.

Discussion: A Permanent Home for DataMIL
The I-Team reviewed a white paper on the future of the DataMIL (attached) prepared by Sandy Schenck. The DataMIL was developed as a research and development project and has proven itself as a concept. The I-team now needs to find a permanent, production-environment home for the DataMIL. Major issues include where to locate the DataMIL and how to support it. A decision willl need to be made soon in order to get the issue built into the Fiscal Year 2005 budget which is now being developed by the Budget Office.

Possible future homes for DataMIL include the Department of Technology and Information (DTI) and the Delaware Geological Survey (DGS). Mark Headd has agreed to put together a meeting of the DataMIL technical team and some staff from DTI to further flesh out the technical and funding needs for a move to DTI. Connie Holland will attempt to get a discussion of the issue scheduled with the

Cabinet Committee on State Planning Issues, which includes many of the Cabinet Secretaries for the larger agencies in the state.

Discussion: Orthophotography and Security

Mike Mahaffie presented a white paper (attached) on Homeland Security Issues surrounding the possible public use, via the internet, of the new, high-resolution orthophotography. The new orthophotography is available to state and local agencies, but their use is somewhat limited by the technical challenges posed by the large size of the data set. Publication via the web would alleviate these problems. Public Safety and Security officials have advised waiting before publishing to allow Governor Minner's Homeland Security Advisor, Phil Cabaud, to determine what risks such publication might pose.

Mike also presented a Recommended Public Dissemination Strategy (attached) that has been submitted to Mr. Cabaud. It suggests re-sampling the data to 1-meter resolution, which is what is currently publicly available (the 1997 orthos). Mr. Cabaud was to discuss this idea with his colleagues at a recent National Emergency Management Association (NEMA) meeting. He had not reported back at the time of the I-Team meeting.

There being no further business, the meeting was adjourned at 2:50 p.m..

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DataMIL White Paper

Executive Summary

The Delaware Spatial Data Implementation Team (I-Team) is seeking a permanent home for its on-line implementation of Delaware's Spatial Data Framework – the state's digital base map. That web site, the Delaware Mapping and Integration laboratory (DataMIL), has been proven as a concept in a research and development environment at the University of Delaware's Research and Data Management Services Office. It needs now to be moved to a permanent, "production" environment.

Options for the future development, operation, and management of the DataMIL, including housing it, would be to locate it at either the Delaware Geological Survey (DGS) or at the Department of Technology and Information (DTI). In either case, it would be advisable to have the DataMIL directed by a steering committee under I-Team oversight. Funding will have to be added to the FY2005 budget to support the project and additional, or re-allocated, staffing would be required.

The DataMIL has been supported in the past by grant funding from the US Geological Survey (USGS) and has served as a leading pilot project for the federal effort to reconfigure basic national mapping programs. DataMIL's success has garnered widespread recognition for Delaware since the project was unveiled by Governor Ruth Ann Minner in 2002; creating a stable and continued support structure for the project will ensure that Delaware continues to lead the nation in spatial data and mapping. We foresee no further financial support from the USGS for at least the next 18 months.

Background

Spatial Data and GIS

Spatial data is the basic map information of the 21st century. The combination of spatial data (where things are) and database information (what things are) in the software known as a "GIS" (Geographic Information System) has revolutionized information management and policy analysis. At all levels of government, and throughout the private sector, maps are now a smart technology. For that technology to work, and to be of real use to the public, the spatial and database datasets used to build GIS systems must be accurate and up to date, and must match across different levels of government and across the public, private, and academic sectors.

Coordinating Delaware's GIS Community

The Delaware Geographic Data Committee[1], the DGDC, was created by the General Assembly in 1998 to ensure that Delaware's GIS Community meets that challenge. The DGDC is a committee with little or no authority, but with a broad mission to facilitate data sharing. The DGDC interacts with national coordination efforts such as the Federal Geographic Data Committee, and works to fit Delaware's spatial data into a national context.

The Delaware Spatial Data Framework

For different spatial data sets to work together they must match a common base map. Nationally, this is known as the National Spatial Data Infrastructure. Delaware's part in this Infrastructure is known as the Delaware Spatial Data Framework. In 2000, the GIS community ratified a Delaware Framework that makes use of existing data, formally recognizing those stewards at the federal, state and county levels responsible for maintaining data in nine general areas that define the Framework: aerial imagery, elevation, geodetic control, governmental units, water features, transportation features, tax parcels, land use and land cover, and geographic names.

Delaware had a head start on Framework data because of the relative freshness of the spatial data that made up the USGS topographic maps for Delaware. Led by the State Mapping Advisory Committee (SMAC), a precursor to the DGDC, Delaware agencies, led by the DGS, worked with the USGS in the early 1990s to complete updates of almost the entire topographic map series for Delaware.

The Delaware Spatial Data Implementation Team

In 2001, Delaware Governor Ruth Ann Minner created a Delaware Spatial Data Implementation Team (I-Team) to oversee maintenance and improvement of Delaware's Framework[2]. The I-Team includes those agencies and local governments responsible as data stewards for various parts of the Framework. It includes the State's planning coordinator, the Cabinet Secretaries of the Departments of Transportation and Natural Resources and Environmental Control, the State's Chief Information Officer, the head of the State Mapping Advisory Committee (DGS), the manager of the Spatial Data Metadata Clearinghouse, and the GIS coordinators of each of the three counties. In early 2003, the I-Team voted to ask the Governor to add representatives of the USGS and the State's Public Safety and Homeland Security.

The Need for a Central Source of Distributed Information

Delaware recognizes the value of having the data that make up the Framework maintained by a distributed network of partners. Those closest to the things

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[1] HB 395, Delaware Geographic Data Committee and Comprehensive State Planning Database System (Attachment 1).

[2] By Executive Order 18, Delaware Spatial Data I-Team (Attachment 2).

being mapped are best suited to map those things and to be data stewards for such data. At the same time, the community needs a central repository of information and links to information around which to organize its use of that information. This function is partly filled by the Delaware Spatial Data Clearinghouse, which is a local node on a national network of clearinghouses that contain information about what spatial data are available, and who administers it. This information is known as Metadata and serves, in a way, as a national card catalogue to spatial data holdings. The University of Delaware's Research and Data Management Services (RDMS) operates and maintains the Delaware Spatial Data Clearinghouse which is accessible through the DataMIL interface.

The National Map Program

The USGS is seeking ways to modernize the topographic map series that has served as the national base map for many years. To take advantage of advances in technology and to meet increases in consumer demand, the USGS is reevaluating its role through the USGS National Map Revision 2010 Program. This program is taking a close look at issues such as data maintenance, data visualization, hard-copy map production, and data availability and distribution. The resulting collection of data products is to be known as *The National Map*.

The DataMIL

Seeking Partners

Starting in 2000, Delaware and USGS staff began exploring ways to use state data to update the federal spatial data that is used in the USGS topographic map series. These discussions led to the idea of providing on-line "topo" maps that combined USGS topographic map data with more up-to-date state data. The idea was to create an on-line collaborative laboratory, or collaboratory, in which data stewards could work with each other's data and the public could create and view "mini-topo maps." This interaction would lead to increased feedback and input on the maintenance of spatial data.

Finding Partners

The University of Delaware's Research and Data Management Services staff joined the team to provide needed expertise. The ArcIMS software suite from ESRI[3] offered a platform on which to build this "collaboratory." RDMS also hosts the Delaware Spatial Data Clearinghouse, and has experience in using ArcIMS and in facilitating distributed data sharing and discussion. The University members of the DataMIL team shared the vision of an improved Delaware spatial data infrastructure and saw clear benefits for supporting research and teaching at all levels, as well as data sharing by all levels of government within the state and federal government.

[3] Environmental Systems Research Institute

A Partnership Agreement

In the spring of 2001, Delaware and the USGS entered into an Innovative Partnership to develop a "collaboratory" to update Delaware's Spatial Data Framework. This partnership included the Delaware Office of State Planning Coordination (OSPC), the Delaware Geological Survey (DGS), the University's RDMS unit, and the USGS. The partnership created the Delaware Data Mapping and Integration Laboratory (DataMIL), a portal to Delaware's Framework and one of nine USGS Pilot Projects for *The National Map*.

The ESRI ArcIMS Internet map service software suite provided the technical foundation for the portal. RDMS provided the programming expertise. Staff from the USGS Mid-Continent Mapping Center converted many quadrangles of Digital Line Graph (DLG) data (the native format of the old topographic map series) into single, statewide data sets. I-Team members began work on data stewardship agreements to facilitate hosting of their data by the DataMIL.

In the spring of 2002, the Framework portal was fully developed and Governor Ruth Ann Minner unveiled the DataMIL at the State's annual GIS Conference.

Since that time, the DataMIL has received worldwide recognition as the most advanced State Spatial Framework maintenance and delivery system in the world. Featured in the plenary session at the 2002 ESRI User Conference attended by an international crowd of 12,000, DataMIL won a Special Achievement Award from ESRI for advanced use of GIS technology. DataMIL was also featured at the University Consortium of GIS 2003 annual meeting in a Congressional Briefing on GIS. DataMIL has also been featured in many articles in GIS Journals and will be published in ESRI's newest book on Internet Mapping Techniques.

DataMIL Functions

The Delaware DataMIL provides a main portal page that features information about Delaware's Framework and GIS community and offers access to several information pathways that lead users into a Map Production Laboratory, a Map Integration Lab, a set of data maintenance forums, and the Delaware Metadata Explorer.

The map production lab is designed around a browser map interface and allows users to create custom maps on-line, download those maps as images, clipped spatial data, or custom topographic maps. The map integration lab is a java-based data interface that allows higher-level GIS users to work directly with the data and suggest and share data edits.

The DataMIL provides a downloadable replacement for the printed USGS topographic maps, *The National Map*, providing the same or more data and

information, and always drawing on the very latest spatial data. This capability directly supports *The National Map Vision* for topographic maps made from the best available data that are maintained to the maximum extent practicable by state and local authorities.

The DataMIL is not only designed to give members of the public access to the latest digital base map of the state, but to enlist their assistance in keeping that base map accurate and up to date. Visitors using only the map production laboratory can highlight areas about which they may have doubts or questions and submit those doubts or questions to a set of data maintenance forums designed to direct discussions about the data to those agencies responsible for the data.

Agreements and Standards

With the creation of the DataMIL, the Delaware I-Team began working on Memoranda and Letters of Agreement (MOAs and LOAs) between the I-Team and the various data stewards to begin to codify responsibility for maintenance of Framework data sets. The I-Team has been crafting Letters of Agreement, for example, with each of the counties regarding maintenance of the cadastral data layer. The I-Team has also been working with a variety of partners to codify data standards to govern future data maintenance. It is partly the existence of the DataMIL as a data portal that has spurred the various partners to tackle this important, but complex, task.

MOAs/LOAs currently in place between I-Team and Data Stewards

Document	Data Steward	Framework Layer
LOA	Kent County	Cadastre
LOA	Sussex County	Cadastre
MOA	DNREC, USGS/ DGS	Hydrology
MOA	OSPC	Landuse/Landcover

The Future of DataMIL

The DataMIL was researched and developed and has proven itself as a concept, but will need to show long-term stability and growth. The I-Team needs to find a more permanent home for the DataMIL in a production/maintenance environment and provide permanent funding to support operation and continuing development of the DataMIL technology.

The DataMIL was conceived, designed, and built as a home for Delaware's Spatial Data Framework data. The DataMIL has shown the power of web map services to present data and information, and many spatial data publishers in the state have asked that their data be included. The DataMIL eliminates the need for duplication in effort by all levels of government, state to federal, to collect

and store Framework data layers. This allows governmental units to create their thematic data on a base that ensures all of Delaware's public spatial data are interchangeable and combinable at varying scales. It also ensures that everyone has the most up-to-date base data available.

Looking forward, the DataMIL team hopes to use the DataMIL as the basis for a testing ground for building a broad-based network of interrelated map services and data nodes that present all of the spatial data sets relevant to Delaware. The network will be based around data from state, local and federal government agencies and from academia. This community of data sources may eventually grow to encompass private sector data and partners as well.

Geography provides a unifying context to data. The DataMIL experience has shown how data and information can be shared across the imaginary boundaries of different levels of government and between agencies within governments, bringing data users back to the important and fundamental relationship of data to the people and places those data users are meant to serve. By enabling a community in which data partners can concentrate on those parts of the state's Framework for which they have a natural responsibility, secure in the knowledge that they have partners who will provide accurate and timely data from other parts of the community, Delaware has created an environment in which partners save time, save money, and avoid confusion. This ultimately results in Delaware being better able to serve the public.

DataMIL Technology

DataMIL uses a variety of technologies to support and meet its objectives. The major software and hardware currently used are divided into categories described below.

GIS Software

DataMIL utilizes ESRI's suite of GIS products. ArcIMS (Internet Map Server) creates the image maps and PDFs in the Map Production Lab, extracts shapefiles, streams binary compressed data to the Data Integration Laboratory, and serves metadata for the Delaware NSDI Metadata Clearinghouse. ArcSDE stores all of the data used in DataMIL inside a geodatabase, as well as all of the metadata in the Delaware NSDI Metadata Clearinghouse. ArcSDE sits on an Oracle 8i Enterprise database. ArcGIS is the tool for making necessary edits to the framework layers, populating the geodatabase, and for users to upload metadata entries to the Delaware NSDI Metadata Clearinghouse.

Discussion Forum Software

The WebBoard 5.0 Conferencing Server provides a rich, collaborative environment using MSDE (Microsoft's SQL Server) for the DataMIL Discussion Forums. WebBoard is a product of Chatspace, Inc. (DBA Akiva Inc.). By

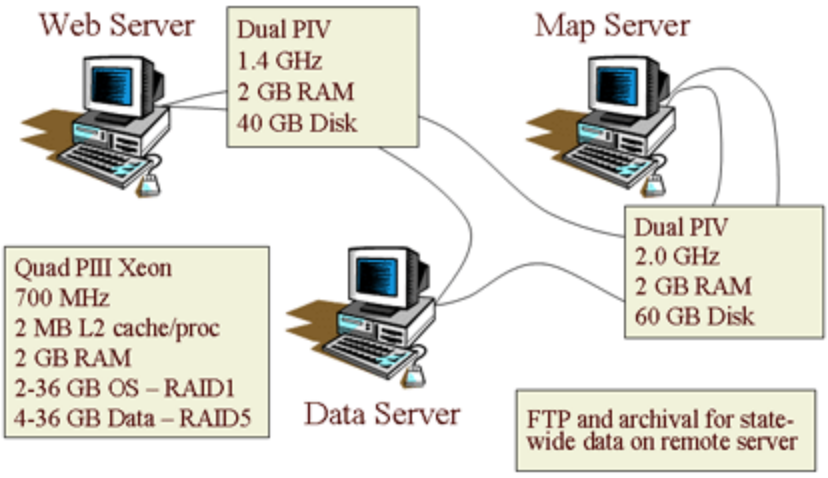
customizing its interface and operation, we achieved a tight integration with the Map Production Laboratory. This allows DataMIL users to transfer graphics and coordinate information of a map detail directly into the user's Discussion Forum posting with just one or two mouse clicks. This feature simplifies a user's task of describing problems detected in a map layer. In addition, WebBoard was modified to provide a notification and tracking system for follow-up on visitors' comments on data problems.

Web Server

DataMIL uses Sun's iPlanet 6.0 web server, an enterprise-scale system with sufficient support and a large knowledge base to draw from. Since many of DataMIL pages are written in Active Server Pages (ASP), Chili!Soft 3.6.2 ASP, also from Sun, is used as the ASP application server.

Hardware, Operating System, Network

The following diagram illustrates the current configuration of DataMIL.



Currently, DataMIL runs on five dedicated machines. Because technology advances so quickly and these machines are now three years old, they need to be replaced so that internal software/hardware linkages are maintained. The current machines were dedicated to development as well as maintenance and production serving of the Framework Data Layers.

In order for the DataMIL to serve as both development and 24/7delivery of Delaware Spatial Data Framework layer services a duplicate system is needed. This is because development cannot be done on a single system without disruption of web service. The current system was built for $100,000 ($50,000 USGS pilot project funds and $50,000 USGS indirect costs). Upgrading the current system would cost at least an additional $50,000. Duplication of the

system to separate the development and production activities would be an additional $50,000, bringing the total cost to approximately $100,000.

This funding was supposed to come from the USGS in FY03 pilot project funds; however, these funds have since been consumed by other functions within the USGS and are no longer available. We anticipate that no further financial support will be available from the USGS for at least the next 18 months.

Software licensing fees must be paid for and kept current. The University of Delaware has received educational discounts for these licenses in the past; however, if the DataMIL were to move outside the UD, then annual licensing fees would run $10,000 to $12,000.

Staffing

Since its inception, DataMIL has been staffed by a coordinated "team" effort. RDMS staff has done most of the web programming and screen/graphic creation, database programming, and hardware and software establishment. Staff at the USGS Mid-Continent Mapping Center in Rolla, Missouri was involved in data manipulation, recoding, and symbolization.

To operate and maintain DataMIL in production mode will require 2 to 2.5 full-time employees (FTEs) with the following skill sets:

1. Web Development
2. Web Programming
3. Database Administrator for Oracle database with programming skills
4. Expertise in ESRI ArcIMS, ArcSDE, and ArcGIS with programming skills
5. Hardware/software system security
6. Proficiency in XML, XSLT and related technologies

It may be possible to accomplish the tasks above with fewer personnel, if they have the right combinations of skills. Those persons involved with the direct running of the DataMIL, however, will need to be FTEs. A cost estimate for salaries for these FTEs is about $250,000 including fringe benefits.

USGS MPO Interaction

Currently the USGS has plans to establish a Mapping Partnership Office (MPO) at the Delaware Geological Survey. The MPO currently consists of a USGS-Water Discipline GIS person from the Dover Office that provides MPO services one day per week. This will continue until December 2003. Beginning January 2004 it is unclear if any support will be available from USGS within the MPO until the beginning of the FY2005 Fiscal year beginning October 2004. Eventually, the USGS FTE manning the MPO will be responsible for data stewardship of the USGS Framework data layers facilitated by liaison activities between USGS and the Delaware I-Team and the Delaware GIS community. Located at DGS within

the University of Delaware, the MPO office will also offer internship opportunities to University students allowing those interested in GIS technologies training while necessary Framework maintenance work is accomplished. This internship will be training for credit only and no additional funding will be needed unless the USGS wishes to extend funding to advance this program to provide additional opportunities for work experience. This internship program will also support a myriad of GIS odd jobs that constantly must be performed to keep DataMIL finely tuned, taking the place of an additional DataMIL FTE for these duties.

Funding

In order to move DataMIL into a production mode and to keep it operational, the following funding will be required.

2.5 FTE + Benefits	$258,000
Hardware/Software and Maintenance with upgrade to duel systems	$112,000
Total	**$370,000**

If housed at the DGS, funding for the DataMIL should be a separate line item within the DGS budget beginning in FY05 from which monies could be drawn to support DataMIL development, maintenance, and production.

A DataMIL steering committee under I-Team oversight will guide the development of the DataMIL portal. Sources of funding might also be apportioned from each state and county agency and brought together to provide the funds for this budget line. The DataMIL steering committee would also be responsible for guiding future development of the DataMIL portal.

Location of the DataMIL

The DataMIL, which was researched and developed by RDMS, has proven itself as a concept and it is complete. The DataMIL now needs to shift to a "production/maintenance" mode and be directly supported by Delaware, for use by Delawareans and others. The DataMIL is currently physically located at the University of Delaware RDMS and staffed by the RDMS. This must change. After fiscal year 2005, RDMS will no longer be able to support this effort.

The new location of the DataMIL services need to take into account the complex nature of the service and the computing expertise that will be needed to maintain the high quality necessary to supply the Delaware Spatial Data Framework Layers to users.

Relocation Options

The DGS has indicated that it is willing to proceed with exploring the possibility of relocating the DataMIL at the Survey. This would maintain its connections to the University and also with the USGS Mapping Partnership Office. Maintaining all current connections assures a seamless transition and least amount of interruption of services to the data users and public. Keeping the DataMIL within the University also allows for software licensing discounts.

Funds would have to be made available to the DGS in the budget to hire the necessary staff and for new hardware and software licenses. This would result in an increase of an additional $370,000.00 per year line item in the DGS budget beginning in FY05. This amount would increase yearly according to salary increases, addition of support staff, and any necessary physical facility improvements.

A second option would be to transfer the DataMIL activities to the Department of Technology and Information (DTI). The DataMIL is a state service and would fall within the purview of DTI. The expertise exists within DTI to manage and maintain the data services. Connections with the USGS Mapping Partnership Office, the DGS, and the Delaware Geographic Data Committee would be maintained through the DataMIL Steering Committee under the purview of the I-Team. Direct impact on DTI's budget would have to be assessed on the availability of current staff and equipment available at DTI presently to handle this relocation.

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ATTACHMENT 1

SPONSOR: Rep. Lofink; Sen. Bunting
HOUSE OF REPRESENTATIVES
139TH GENERAL ASSEMBLY

HOUSE SUBSTITUTE NO. ___1___

FOR

HOUSE BILL NO. 395

AN ACT TO AMEND CHAPTER 91 OF TITLE 29 OF THE DELAWARE CODE RELATING TO STATE PLANNING.

BE IT ENACTED BY THE GENERAL ASSEMBLY OF THE STATE OF DELAWARE:

Section 1. Amend § 9101(h), Title 29, Delaware Code, by adding a new subsection (h)(4) to read as follows:

"(4) Delaware Geographic Data Committee and Comprehensive State Planning Database System.

The Office of State Planning Coordination shall be responsible for identifying and insuring that all source data and metadata relating directly or indirectly to planning issues, including databases resident on automated systems and non-automated maps and graphics materials maintained or prepared by state agencies, state supported agencies or developed through state funded projects, will be made available to planning agencies at the state, regional and local levels and to the public. This information is to be made available to all potential users in a manner that provides easy and direct access, subject to appropriate security and confidentiality protocols. Data shall be cataloged to provide a comprehensive and coordinated inventory of data relating to planning issues.

The Delaware Geographic Data Committee shall be established, under the guidance of the Office of State Planning Coordination, to insure the implementation of a coordinated program to catalog and distribute geographic data. The Delaware Geographic Data Committee membership shall consist of representatives from state agencies, state funded agencies, county and municipal governments, the Delaware Geological Survey and the University of Delaware. Other appropriate private and public institutions and organizations may serve as ex-offico members of the committee as needed. The Delaware Geographic Data Committee shall establish subcommittees or workgroups as needed.

The Office of State Planning Coordination, in cooperation with the Delaware Geographic Data Committee, and in consultation with the responsible agencies and organizations, shall develop the procedures and identify the resources necessary to ensure that each database reflects the latest and best available

information. To provide for statewide coordinated knowledge of the available databases, the Office of State Planning Coordination, in consultation with Delaware Geographic Data Information Committee and appropriate state, regional and local agencies, will coordinate the development of a metadata system as the inventory and catalog of databases, maps, graphic representations, and other appropriate information. The metadata standards for this inventory shall be set by the Office of State Planning Coordination in consultation with the Delaware Geographic Data Committee.

All state agencies and other organizations receiving state funds in whole or in part for the development of planning related data sets and related maps and other graphics shall comply in developing and maintaining the Delaware inventory of databases, maps, graphic representations, and other appropriate information relating to planning issues. This compliance shall require that state agencies provide documentation of all existing relevant databases, maps, and graphic representations using the standards set by the Office of State Planning Coordination in consultation with the Delaware Geographic Data Committee. Agencies will be required to submit metadata to the Delaware inventory as new data is developed and to provide an annual update of the documentation of databases, maps, and graphic representations. State agencies shall make databases, maps, and graphic representations developed either directly or indirectly with state funds accessible to other state agencies, regional county, municipal governments and the public subject to security and confidentiality protocols and reasonable processing costs.

The Delaware Geographic Data Committee shall serve as the state contact for the Federal Geographic Data Committee. A subcommittee of the Delaware Geographic Data Committee shall be the State Mapping Advisory Committee (SMAC). The SMAC shall be organized as follows:

The State Mapping Advisory Committee shall consist of representatives of state, county and municipal agencies, the Delaware Geological Survey, the University of Delaware and other appropriate educational institutions. Other public and private institutions may serve in ex-offico members.

The chair of SMAC shall be the State Geologist or Acting State Geologist of the Delaware Geological Survey, or his or her designee.

The SMAC shall consolidate statewide mapping requirements into a single annual report for submission to the United States Geological Survey (USGS). This annual report shall be submitted to the Delaware Geographic Data Committee for review and approval for submission to the USGS."

SYNOPSIS

The foundation of sound planning is a comprehensive, up-to-date body of background information and data, including reliable data files and hard copy maps. In Delaware, there are a number of relevant databases, some of them maintained in a geographic information system (GIS). These systems, usually tailored to meet a particular agency's needs, should be coordinated and consolidated to eliminate duplications, improve data management, allow

economies of scale, and expand access for planning purposes at all levels of government without compromising the data or the interest of the agencies or organizations which have developed and maintain the basic data sets. Considerable work has been done by the State, the University of Delaware and other agencies to build the data files and to develop techniques for data sharing. This Act provides that the Office of State Planning Coordination shall assume a leadership position in coordinating and managing a clearinghouse for the inventory and documentation of databases, maps, and graphic representations developed by state agencies and local government relating to planning issues. The Act will establish a State GIS Data Committee that will establish data documentation standards, guidelines for data development, and a clearinghouse for a data inventory and data publishing.

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ATTACHMENT 2

The Text of Executive Order 18
Establishing A Delaware I-Team
As signed by Delaware Governor Ruth Ann Minner July 19, 2001

EXECUTIVE ORDER
NUMBER EIGHTEEN
RE: DELAWARE SPATIAL DATA I-TEAM

WHEREAS, data that can be analyzed based on its geographic location - "spatial data" - is essential to planning and operations in many levels of government and in the private sector;

WHEREAS, dependable and accurate spatial data resources are a key component of the planning and management activities called for in the Livable Delaware agenda (Executive Order No. 14);

WHEREAS, accurate, well-coordinated spatial data provides a valuable part of the knowledge infrastructure needed by all levels of government;

WHEREAS, spatial data sets can be expensive to produce and they must be well coordinated to maximize their usefulness;

WHEREAS, in 1998, the Delaware General Assembly established a Delaware Geographic Data Committee to help coordinate the development and use of spatial data by state agencies, county and local governments, and the private sector;

WHEREAS, the Delaware Geographic Data Committee, working with the State Mapping Advisory Committee, has developed a coordinated, open community of users of spatial data in Delaware;

WHEREAS, this community includes state agencies, county governments, local governments, the academic community and the private sector;

WHEREAS, the Delaware Geographic Data Committee works closely with the Delaware Spatial Data Clearinghouse, within the University of Delaware, to distribute and share spatial data resources;

WHEREAS, the Federal Office of Management and Budget and the Federal Geographic Data Committee have identified a need for a National Spatial Data Infrastructure (NSDI) at the national level to provide a "data skeleton" on which to organize a wide range of spatial data sets;

WHEREAS, the State of Delaware recognizes the need for Delaware to take part in the NSDI by establishing and maintaining a Delaware Spatial Data Framework;

WHEREAS, the Delaware Geographic Data Committee has approved a Delaware Spatial Data Framework of nine spatial data sets, consisting of Transportation, Streams and Water Bodies, Elevation, Digital Aerial Photos, Governmental Units, Land Use and Land Cover, Tax Maps/Land Parcels, Geographic Names and Geodetic Control Points;

WHEREAS, the Delaware Geographic Data Committee and the State Mapping Advisory Committee have acquired or produced data sets to fill the nine layers of Delaware's approved Framework;

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WHEREAS, the Federal Office of Management and Budget has developed a new approach to establishing and maintaining the spatial data layers of the NSDI that depends on state-level Implementation Teams (I-Teams) for leadership and coordination;

WHEREAS, effective I-Teams are made up of all the agencies and entities that produce and distribute spatial data; and

WHEREAS, establishing a Delaware I-Team would allow the state of Delaware to take full advantage of the partnerships and teams developed between all states and federal agencies;

NOW, THEREFORE I, RUTH ANN MINNER, by the authority vested in me as Governor of the State of Delaware, hereby declare and order on this 19th day of July, 2001:

1. A "Delaware I-Team" is hereby established, within the Delaware Geographic Data Committee.

2. The Delaware I-Team shall include representatives of the following:

    - The State Planning Coordinator or his or her designee, who will serve as the chair of the I-Team,
    - The Secretary of Transportation, or his or her designee,
    - The Secretary of the Department of Natural Resources and Environmental Control, or his or her designee,
    - The Chief Information Officer of the State of Delaware, or his or her designee,
    - The Chair of the State Mapping Advisory Committee,
    - The Manager of the Delaware Spatial Data Clearinghouse,
    - The GIS Coordinator for New Castle County
    - The GIS Coordinator for Kent County
    - The Director of Mapping and Addressing for Sussex County.

3. The Delaware I-Team shall complete and submit to the Office of the Governor an annual report and maintenance plan for the Delaware Spatial Data Framework.

4. The report and maintenance plan shall include:

    - The status of the data sets identified as the Delaware Spatial Data Framework,
    - An assessment of needed improvements to those data sets, and
    - A plan for funding the acquisition of new data for maintenance of those data sets.

5. The I-Team shall negotiate, wherever possible, innovative partnerships

with federal, state, county and local agencies for acquisition of new data for maintenance of the Framework.

6. The I-Team shall identify and pursue all means to make the data sets of the Framework data available to spatial data users at all levels of government.

Security Issues and Distribution Questions
Delaware 2002 Orthophotography

Background

In March of 2002, the state of Delaware, via the Delaware Spatial Data Implementation Team (I-Team)[1], entered into a Professional Services Agreement with EarthData International LLC, of Maryland, for "creation of digital orthophotography suitable for planimetric and parcel mapping, and land use and land cover spatial data." The agreement was the result of a Request for Proposals (RFP) issued by the I-Team in October, 2001.

That agreement resulted in delivery, in April of 2003, of 2010 tiles of digital orthophotography at a map scale of 1:2400 with a 0.25 meter (approximately 1-foot) pixel resolution. Governor Minner announced the delivery of this imagery data on April 29 at the Delaware GIS 2003 Conference at the University of Delaware.[2]

The orthophotography is part of the Delaware Spatial Data Framework,[3] a standard, seamless, and up to date digital base map of Delaware. The nine layers of the Framework – Transportation, Water Bodies, Elevation, Governmental Units, Land Use and Land Cover, Tax Parcels, Geographic Names, Geodetic Control Points, and orthophotography – are Delaware's portion of the federal government's program to replace the old USGS Topographic Map series – This program is known as *The National Map*.[4]

The I-Team plans to distribute the imagery data to state, county and local agencies for use in their Geographic Information System (GIS) applications. All three counties have plans to use the new photography as background images in on-line parcel mapping applications. The I-Team also plans to make the data available for public viewing on-line via the Delaware Data Mapping and Integration Laboratory (DataMIL),[5] announced by Governor Minner in April of 2002 at that year's Delaware GIS Conference. The DataMIL also serves as a lead Pilot Project for the USGS *National Map* program.

In addition, copies of the new orthophotography have been requested by, among many others, the Air Force, for use in base mapping for the Dover Air Force Base, the Federal Emergency Management Agency, for use and publication as a base map and background graphic for updated digital and hard copy Flood Insurance Rate Maps, and by the federal Department of Homeland Security

[1] Established by Governor Minner in 2001 (Executive Order 18)
[2] See http://www.udel.edu/PR/UDaily/2003/gis050103.html and http://www.state.de.us/planning/coord/dgdc/ortho_news_release.pdf
[3] See http://www.state.de.us/planning/coord/dgdc/framework/intro.htm
[4] See http://nationalmap.usgs.gov/
[5] See http://www.datamil.udel.edu/

(DHS) for use in mapping the "133 Urban Areas" of concern in homeland security operations. The 133 Urban Areas include portions of Kent County and northern New Castle County. Imagery provided to the DHS for the 133 Urban Areas project by several other states is publicly available on-line via the federal government's *geodata.gov* portal, which is designed to give federal, state and local spatial data users, and the public, easier access to data resources.[6]

The 2002 orthophotography replaces 1997 orthophotography that is at a slightly lesser resolution (1-meter). The 1997 imagery data is currently available on-line for viewing via the DataMIL and on several County web sites. Earlier, lower resolution, imagery data sets for Delaware are available at other web sites and via the USGS National aerial Photography Program (NAPP).

Security Concerns

On July 29, I-Team Chair Connie Holland and staff met with Phil Cabaud, Governor Minner's Homeland Security Advisor, Dan Cox, Deputy Secretary of the Dept. of Safety and Homeland Security, and Jamie Turner, Director of the Delaware Emergency Management Agency to discuss perceived security risks around making the 2002 orthophotography publicly available.

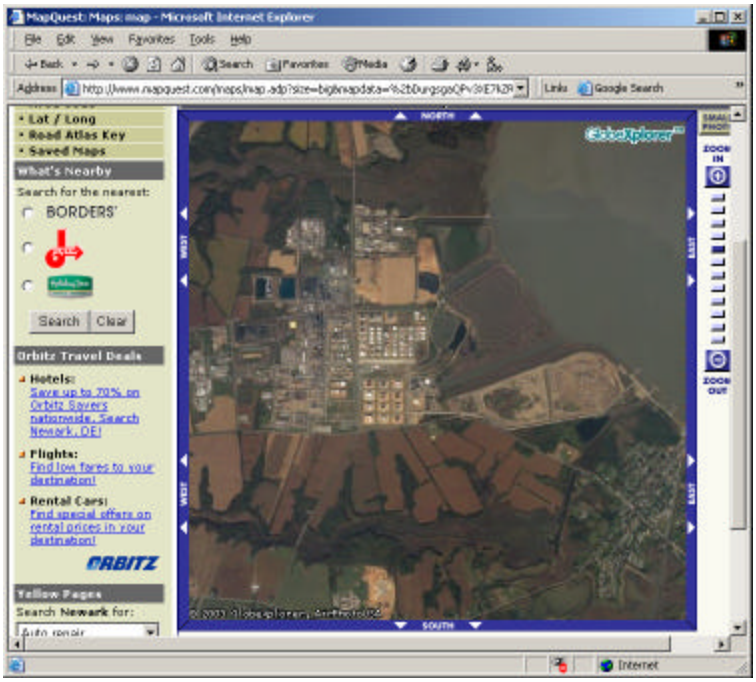
The group is concerned that making the higher-resolution data publicly available may make it easier for terrorists and others to plan attacks on Delaware by giving them very good information about the state.

Access to high-resolution orthophotography via the internet may give terrorists and/or criminals the ability to perform reconnaissance of a target without having to physically visit the target site. This risk may depend on the imagery data being of sufficient resolution and on there being other attribute information attached to, or presented with, the imagery data.

According to a National Infrastructure Protection Center (NIPC) document provided by Mr. Cabaud, "administrators of GISs have to determine the extent to which access to data will be withheld. Placing restrictions on access to information that is accessible by other means, such as a road map, makes no sense."[7]

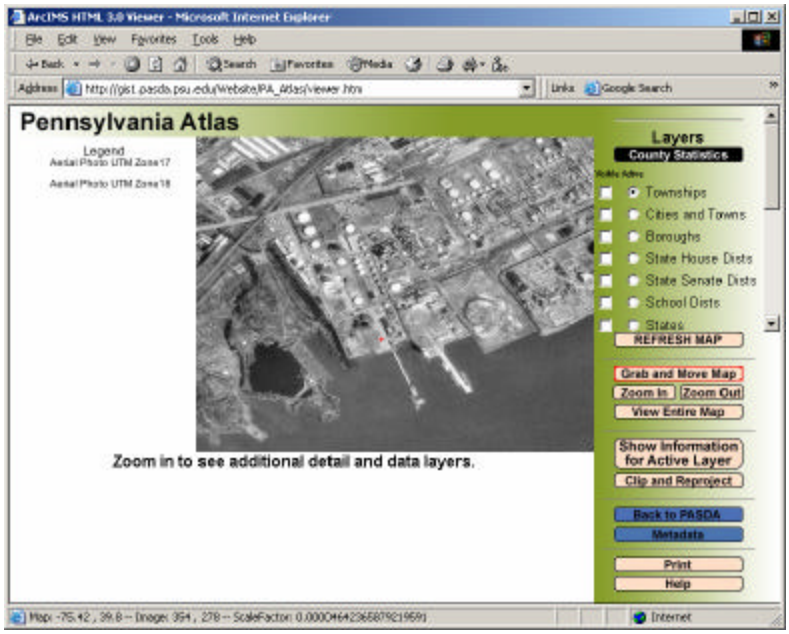
[6] *Geodata.gov* describes itself as "part of the Geospatial One-Stop initiative, one of the 24 OMB electronic-government initiatives that will enhance government efficiency." See http://geodata.gov/

[7] *Security Concerns Regarding Geographical Information Systems* (February 2003), National Infrastructure Protection Center, Page 2.



In a test by Office of State Planning Coordination (OSPC) staff following the July 29 meeting, several additional sources of imagery showing parts of Delaware were found. These included the *MapQuest* web site,[8] which yielded an image (right) of the Delaware City area. This image appears to use commercially available imagery data.

The Pennsylvania Atlas web site of the GIS coordinating group Pennsylvania Spatial Data Access (PASDA)[9] presents orthophotography that includes the northernmost portions of Delaware, such as the border area at Marcus Hook (below).



In addition, OSPC staff searched the *geodata.gov* portal and found over 300 records of on-line orthophotography and/or base map data using or derived from imagery data. Many of these were publicly available; others were password-protected, most for commercial reasons. A selection from around the nation is available.

Staff were able to access high- and medium-resolution photography from jurisdictions that include Philadelphia, New Jersey, San Diego, Dallas, Honolulu, and suburban Washington DC.

The perceived risk of having the 2002 imagery data available via the web is that it may be of a sufficient resolution to allow a photo-interpreter to infer the location of, and ways to access, specific potential terrorism targets within Delaware. It is

[8] See http://www.globexplorer.com/mapquest/
[9] See http://gis1.pasda.psu.edu/Website/PA_Atlas/viewer.htm?Title=Pennsylvania%20Atlas

as yet unclear whether the imagery data is at a sufficient resolution to be more of a risk than either the existing 1997 imagery data or other imagery data available on-line. It is generally considered within the national GIS community that there is little risk in public access to imagery data at the 1-meter resolution now common nationally and available on Delaware's DataMIL.

The NIPC document goes on to point out that more detailed attribute information "such as specific police patrol routes in a police district, clearly should be shielded from general access."[10] In Delaware's GIS Community, there are some data sets that are not made generally publicly available because of security concerns. Specific GIS data relating to well-head protection areas, published by the DNREC's Source Water Assessment and Protection Program (SWAPP), for example, is available only via request under DNREC's Freedom of Information Act procedures. This is data that could potentially give terrorists very specific targeting information relative to Delaware's drinking water supplies.

It is also the case that adding specific attribute information, other than base-map information such as the Delaware Spatial Data Framework, to the available imagery might increase the risk.

Public Domain Issues

In its RFP for the orthophotography project, the I-Team included specific language to ensure that the resulting imagery data would be publicly available. This language was primarily designed to stave off proposals from vendors hoping to create additional revenue sources for themselves by including data licenses that would allow them to re-sell the imagery data to the public or to other levels of government. The RFP included the following language:

> The project shall result in digital data files that are capable of being made fully and freely available to state agencies and to county and local governments and their subcontractors. The data shall also be available without restriction to the United State Geological Survey or other federal agencies, at the discretion of the I-Team, for use in federal-state cooperative agreements and other similar arrangements. Proposals should contain estimates of the costs of duplication of the data set for distribution among state agencies and others.
>
> The data files shall be available at least for viewing on-line by members of the public via the internet. The I-Team will consider proposals that utilize a "sliding scale" of public availability versus resale value for the vendor in order to reduce the cost to the state as much as possible but following the non-restrictive clauses outlined in the previous paragraph.[11]

[10] *Security Concerns Regarding Geographical Information Systems* (February 2003), National Infrastructure Protection Center, Page 2.

[11] REQUEST FOR PROPOSALS: Delaware Orthophotography Project (October 17, 2001), Delaware spatial Data I-Team, Page 6

This language is included by reference in the Professional Services Agreement between the I-Team and EarthData.

Other State Approaches

OSPC staff solicited comment and input from the members of the National States Geographic Information Council (NSGIC), a national organization of state geographic information coordinators. A document of the responses to that query is included as appendix 2. Several state coordinators noted that they do not restrict access to imagery data. One state, Virginia, noted that it makes a reduced-resolution version available publicly and "blurs" the imagery data over specific sensitive areas.

This discussion also brought to our attention a RAND Corporation Study of the risk posed by public domain spatial data. The study was undertaken for the National Imagery and Mapping Agency. According to Ron Matzner, then an employee of (and now a consultant to) the Federal Geographic Data Committee, "recommendations appeared to be that the availability of such data in the public domain poses little threat and is of little actual use to terrorists. In most cases, there are other sources of information for a determined terrorist."[12]

The larger State GIS Coordinating community appears to be awaiting a possible release of results from that study that should serve as federal guidance on this issue. Sources at the USGS say that it is not clear when this study will be available to federal and state agencies.

Recommended Approaches

Based on information gathered through this discussion, the I-Team staff recommends the following approaches, in order of preference. Whatever approach is adopted, this issue should be revisited when the results of the RAND Corporation study are made available or when more specific guidance is provided by the Federal Government.

Approach One – Full data availability at full resolution

Allow the 2002 imagery data to be distributed to the public via the internet (DataMIL and other web portals).[13]

Access to the native imagery data files should be by request via approved distribution channels which would include selected state and county agencies for on a limited distribution, the USGS's EROS Data Center, and approved private sector vendors (under agreement with the I-Team) for larger area data distribution.

[12] E-mail to Mike Mahaffie, June 5, 2003.

[13] It should be noted that internet access does not yield the same high level of resolution as direct use of the native imagery data files.

Approach Two – Full data availability, with selective "blurring"
Allow the 2002 imagery data to be distributed to the public via the internet (DataMIL and other web portals) with some areas, to be determined by the I-Team and the Delaware Department of Homeland Security and Public Safety, "blurred" to a lower resolution.

Access to the native imagery data files should be by request via approved distribution channels as noted in Approach One, with those using the data required to agree to blur or not publish selected portions of the imagery data.

Approach Three – Full data availability at reduced resolution
Allow the 2002 imagery data to be distributed to the public via the internet (DataMIL and other web portals) at a lower resolution. Likely this would be a 1-meter resolution, to match the data now most widely available.

Access to the full imagery data set, at the reduced resolution, should be by request, via approved distribution channels as noted in Approach One. Access to the full resolution imagery data would be by special request and with approval required by the I-Team prior to release. Approval would be contingent on the applicant agreeing not to publish the data at its full resolution.

Appendix 2

State Coordinator Perspectives: Orthophotography and Security

In preparation for the discussion on perceived security issues with the sharing and publication of the 2002 Delaware Orthophotography data set, the Office of State Planning Coordination solicited comment and input from the members of the National States Geographic Information Council (NSGIC), a national organization of state geographic information coordinators. These are the responses, presented in the order they were received. The Office has added commentary, in italics, where needed to clarify jargon and to relate some comments to Delaware's project.

Bill Shinar, State of Virginia [Bshinar@vgin.state.va.us]
We've just completed delivery of our statewide high resolution digital orthos. About 1/4 of the state was at 1 foot resolution. It is not public domain, but can be shown on the web at a reduced resolution. (*The RFP for the Delaware project stipulates that the data is to be made publicly available*.)

In our license agreements we required that each local government that has a military installation to have a relationship with that installation which would allow them to workout whether there was any security issues related to that data. (*The contractor that is developing a GIS system for DAFB, along with other parts of the air Mobility Command, Tesseract Technologies, is aware of the existence of this data set, The native TIFF format files for an area including the Base and a wider study area, have already been shared with Tesseract. DAFB Staff have met with OSPC staff and – at a staff level – have indicated that they have no problem with public availability of imagery of the Base.*)

We are also providing each local government with a MrSID (*a commercial image compression software widely used in geospatial applications*) of the high resolution imagery for their jurisdiction and all surrounding jurisdictions. For this product we have dissolved the digital orthos over all military installations and over the state's two nuclear reactors to 5 meters. This insures that even if the data leaks out those areas do not reveal anything that is not available commercially.

As relates to other critical infrastructure I think that the minimum standard might be what is available commercially, which in most cases is at least down to a meter.

When I spoke to our commonwealth preparedness committee I had in my briefcase a CD with air ducts from the pentagon and CIA taken from a commercial account (VARGIS). When they saw our data they did begin with the "we can't let anyone have access to this" approach. I then mentioned the CD and their concerns went away.

When we've talked with the utilities we've argued that obscuring there facilities actually will draw more attention than leaving them as they are. I hope this helps some.

Anthony Spicci, State of Missouri [spicca@mdc.state.mo.us]
(*And a member of one of the first Urban Search and Rescue teams to respond to New York in the days after 9/11*)
Missouri does not have a formal policy on the sharing of GIS data. There are policies that protect certain data such as health databases and ESA data. These are specific to the content of the data, but apply if the data is represented in a GIS. The MGISAC agreed that the open sharing of data is critical to the success of the State. Thus, we as a state do not have a formal policy to restrict access to GIS data. Note that there may be a host of legislation out there to restrict access, especially after 9-11, but I am not aware of it. I should point out that individual agencies may choose to restrict access.

Shelby Johnson, State of Arkansas [shelby.johnson@mail.state.ar.us]
Although we don't have a formal policy in place we frequently use and refer to a decision tree diagram that our very own NSGIC Homeland Security Working Group developed (Bill Burgess, Zsolt Nagy and others) It probably wouldn't be too hard to craft a written policy based upon this diagram. If you read through and follow its paths you can see the diagram does a very good job of supporting open data access. I'm attaching a power point that has the diagram. (*We have a copy of this.*)

Bill Burgess, State of Maryland [WBURGESS@dnr.state.md.us]
The FGDC (*Federal Geographic Data Committee*) Homeland Security Work Group (HSWG) is taking up development of a policy on data access issues. We are still unsure if the RAND report will be released for public consumption, so the HSWG is putting together a Subcommittee to address this important issue. (*The Rand Corporation has done a study, for NIMA, on this issue.*) The DRAFT objectives and scope are provided below. I think these have been modified, but I don't have the current version.

> OBJECTIVES: Provide principles for evaluating the extent to which public accessibility of geospatial data might affect vulnerability for attack.
>
> SCOPE:
> a) Clarify concerns related to the homeland security implications of publicly accessible geospatial data, as well as implications to changing access to publicly available geospatial data
> b) Provide criteria for thinking about the sensitivity of a particular data holding
> c) Identify ways that organizations balance security concerns and public information access

I plan to represent NSGIC on this subcommittee and we also plan to make this one of the topics at the annual conference (*NSGIC, September*), so start putting in your out-of-state travel requests and plan on going to Nashville this September. I will pass along the work of this group as appropriate to get input.

You should also review the Federal Register / Volume 68, No. 72 / Tuesday, April 15, 2003 / Proposed Rules. The title is Procedures for Handling Critical Infrastructure Information and it is proposed regulations from the Department of Homeland Security. I think the following link will take you to this regulation: http://frwebgate6.access.gpo.gov/cgi-bin/waisgate.cgi?WAISdocID= 31560085622 +3+0+0&WAISaction=retrieve

As written, these regulations appear reasonable to me and they will encourage the private sector (utilities, etc.) to provide their data. However, these regulations are not focused on geospatial data and they could "evolve" into something pretty ugly for our community. You need to be aware of this and think about the consequences. Also, they apply to State government.

(OSPC Staff *have reviewed this rule-making proposal and it looks like, at the moment, it is focused on the subject of protecting data that is submitted to the federal Homeland Security Department from FOIA review. This is partly to keep highly sensitive data protected, but also appears to address private sector fears of proprietary data being shared publicly.*)

Eugene Trobia, State of Arizona [GTrobia@lnd.state.az.us]
We don't have a policy that I am aware of in AZ. We do get to access the FBI imagery (our DPS does) and critical facilities on it are blurred out - like over the air force bases and nuclear power plant.

Ron Matzner, a Coordinator for the FGDC and OMB with the States [rmatzner@usgs.gov]
To the best of my knowledge, no definitive policy has been issued by OMB or any other appropriate entity.

The RAND Corporation recently concluded a study of the risk posed by public domain data. The FGDC's Homeland Security Working Group commissioned the study. (*We have, as indicated above, also heard that this was sponsored by NIMA.*) The report is expected by June 30. (*We checked with some federal contacts on 6/30/03 and learned this <u>may</u> be released to the community later this summer.*) The RAND Corporation briefed the HSWG several months ago. At that time, preliminary recommendations appeared to be that the availability of such data in the public domain poses little threat and is of little actual use to terrorists. In most cases, there are other sources of information for a determined terrorist.

Zsolt Nagy, State of North Carolina [ZsNC@nc.rr.com]
Mike D [Domerantz? (*Yes, a USGS staff person.*)] came and spoke to the NC Geographic Information Coordinating Council about 'Risks and Benefits' to putting GI (including imagery) out for Internet viewing, We have been peppered with questions on this policy for awhile and it has been anti-productive in moving some state initiatives forward.

Mike provided our Council members "rational food for thought" (their words), and gave them alternatives to think about, rather than shooting from the hip. Our members were very appreciative of his remarks. As I understand from the report of the FGDC HS Work Group meeting last week, the context Mike D brought to NC is related and in sync with the anticipated work cited by Bill B on the FGDC data access policy project.

We (NC) are looking at the minutes from our Council meeting and may develop a stand alone web document that includes highlights from the talk by Mike and reference to the NSGIC decision tree. Not enough people heard the message so we are trying to get the message out, in the state. When this material is prepared, I will get the word out to you too.

Note: Mike Domerantz was cautious enough to respond to Zsolt's e-mail with a brief note that "because the FGDC activity Zsolt mentions . . . is just getting (slowly) started, it's a little premature to assume that my remarks will be in sync with the outcome of that effort."

DRAFT

Recommended Public Dissemination Strategy
Delaware 2002 Orthophotography

Summary
Delaware's 2002 orthophotography should be made available on-line and via publication at a reduced resolution to reduce potential security risks. The full-resolution form of the orthophotography should be available to federal, state and local government agencies for internal use. The full-resolution data set may also be made available to other data users on a limited basis after review by state officials.

Background
The state of Delaware, via the Delaware Spatial Data Implementation Team (I-Team), has acquired statewide false-color infrared digital orthophotography at a map scale of 1:2400 with a 0.25 meter (approximately 1-foot) pixel resolution. The photography was collected in early spring, 2002. It is stored as 2010 tiles (approx. 1-kilometer square) and takes up 67 DVDs. The 2002 imagery was paid for by several state agencies and one Delaware County and was intended for use by state, county and local agencies as well as for public access over the internet via the Delaware Data Mapping and Integration Laboratory (DataMIL).

The 2002 orthophotography is part of a series of aerial photography projects that included data collection in 1984, 1992 and 1997. The 1997 orthophotography, which is at a map scale of 1:24,000 with a 1-meter resolution, is currently available on-line via the DataMIL. The I-Team has discussed continuing the series with additional data collection in 2005 or 2007.

Security Concerns
State Homeland Security and Public Safety officials are concerned that making the orthophotography publicly available may pose a security risk by giving terrorists and/or criminals the ability to perform reconnaissance of targets without having to physically visit target sites. It is generally acknowledged that similar data, especially at the 1-meter resolution, is already widely available from several public and private on-line sources. What is of concern is the added clarity of the high-resolution orthophotography. This may be an added risk in areas that include such facilities as military installations and high-risk land-uses such as oil refineries.

Recommended Public Dissemination Strategy
1-Meter Resolution Orthophotography on the Delaware DataMIL
A lower-resolution version (1-meter) should be made available for public use on the DataMIL. This will match the resolution of the 1997 orthophotography now available on the DataMIL. It also matches the resolution of much of the orthophotography of Delaware and surrounding areas that is available on-line from the federal government, other states, and the private sector. As such, it should not increase the security risk. This application will also fulfill many of the

needs of GIS-users requesting the photography for graphic backdrop for their GIS publications.

Full Resolution Orthophotography for Internal Use
The full resolution form (0.25-meter) of the orthophotography should be available to federal, state and local government agencies as well as to the academic sector for internal use. This will allow full use of the orthophotography for planning and data-development purposes, as originally intended. The lower-resolution version should be used for publication of map-products.

Full Resolution Orthophotography for Limited External Use
The full-resolution orthophotography may also be made available to other data users on a limited basis after review by state officials. These users will likely include private sector land development firms, community and not-for-profit groups, and academic users. Applicants will be required to make a formal request and will provide enough information to allow state officials to determine their legitimacy, need, and appropriate uses of the orthophotography.

Potential Enhancement: Protected On-Line Distribution
The full-resolution form (0.25-meter) of the orthophotography is difficult to distribute, given its large file size. It is technically feasible to make the full resolution form available on-line for GIS users using the right kind of GIS software as a “streamed” image. This application can be password-protected to allow for use by authorized entities without making the data generally available.

Potential Added Security Enhancement: Selective Exclusion
It is possible to remove or obscure selected areas from the orthophotography if deemed necessary to further protect critical facilities. In some instances, parts of an image are simply removed. In other cases, areas are “blurred” to further reduce resolution. It may be possible to select specific areas of the state (e.g. the Dover Air Base or the Motiva Refinery) for exclusion for the orthophotography. It should be noted that these are not currently excluded for publicly available orthophotography.